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P.O. Box 1450
Alexandria, VA 22313-1450

On 10/10/03

TOWNSEND and TOWNSEND and CREW LLP

By: ______________________

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Victor B. Kley

Application No.: 10/659,737

Filed: September 9, 2003

For: FLUID DELIVERY FOR SCANNING PROBE MICROSCOPY

Customer No.: 20350

Confirmation No.: Unassigned

Examiner: Unassigned

Technology Center/Art Unit: Unassigned

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to examination of the above-referenced application, please enter the following amendments and remarks:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Amendments to the Drawings begin on page 8 of this paper and include an attached replacement sheet.

Remarks/Arguments begin on page 9 of this paper.

An **Appendix** including amended drawing figures is attached following page 9 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Original) A micro electromechanical systems (MEMS) device comprising:

a scanning probe microscopy (SPM) component; and

one or more fluidic channels formed in the SPM component.

2. (Original) The MEMS device of claim 1 wherein the SPM component is used for nanomachining.

3. (Currently amended) A micro electromechanical systems (MEMS) device comprising:

a scanning probe microscopy (SPM) component;

at least one fluidic channel formed in the SPM component; and

a venturi tube formed along a portion of the fluidic channel,

wherein a vacuum can be developed by a flow of a gas or fluid through the venturi tube.

4. (Currently amended) A micro electromechanical systems (MEMS) device comprising:

a scanning probe microscopy (SPM) component;

a fluidic channel formed in the SPM component, the fluidic channel configured to deliver fluid to a tip of the SPM component; and

an amount of an isotope disposed along the fluidic channel,

wherein the particles emitted by the isotope can be delivered by a fluid flowing in the fluidic channel to the tip to affect the charge distribution in a region about the tip.

5. (Original) The MEMS device of claim 4 wherein the particles delivered to the tip can be used to perform nanomachining on a workpiece.

6. (Currently amended) A micro electromechanical systems (MEMS) device comprising:

a scanning probe microscopy (SPM) component;

an amount of an isotope disposed on the SPM component;

a circuit for collecting particles emitted from the isotope to store an accumulated charge; and

a contact formed on the circuit to provide an amount of current that can be produced from the accumulated charge.

7. (Original) The MEMS device of claim 6 wherein the amount of isotope comprises an isotopic charge emitter, wherein the accumulated charge can serve as a source for local electrical power to operate active electronic elements located on or near the MEMS device.

8. (Currently amended) The MEMS device as recited in claim 4 ~~which uses~~wherein the isotope is Americium 241.

9. (Original) The MEMS device as recited in claim 4 wherein the amount of isotope is disposed in a single isotopic region on the SPM device, wherein the single isotopic region contains 1 microcurie or less of radioactivity.

10. (Original) The MEMS device such as in claim 4 wherein the amount of isotope comprises a plurality of isotopic regions, each of which contains 1 microcurie or less of radioactivity.

11. (Original) Any nanocavitation technique which uses an nanocavitation inducing member to image or measure the surface to which the cavitation is to interact with by a Scanning Probe Microscopy Method.

12. (Canceled)

13. (Original) Any outflow, inflow, circulating or recirculating fluid system in which the Scanning Probe Microscopy means is integrated with the fluid transfer means.

14. (Original) Any outflow, inflow, circulating or recirculating fluid system in which nanomachining or surface modification by any means is conducted by a means integrated with said means.

15. - 22. (Canceled)

23. (Original) Any system for Scanning Probe Microscopy, Nanomachining, Nanomanipulation, or multimode operation in which the mechanical, electrical, electro-optical, radiological, are changed by mechanical or electrical means.

24. (Original) Any system for Scanning Probe Microscopy, Nanomachining, Nanomanipulation, or multimode operation in which the modality of operation is obtained by use of mecahnical members interacting with or substituting for the primary sense or interaction structure.

25. (Canceled)

26. (Original) Any application, measurement or operation in which the device of 10 acts in a specific or constrained region.

27. (Original) Any application, measurement or operation as in 26 in which the application uses chemical or biological chips or devices in which material for the operation, application or measurement is placed in wells in a regular arrangement on a plane or surface(s).

28. (Original) Any application, measurement or operation as in 26 in which the target material is DNA which has been marked optically, electrically or chemically so as to

interact with optical, electrical or chemical detectors or emitters associated with or integrated in the device.

29. - 35. (Canceled)

36. (New) The MEMS device of claim 1 further comprising one or more control valves to control a flow of fluid in the one or more fluidic channels.

37. (New) The MEMS device of claim 36 further comprising one or more movable members formed in the SPM component, at least one fluidic channel being formed in each movable member, wherein fluid flow through the at least one fluidic channel produces movement in the movable members.

38. (New) The MEMS device of claim 37 further comprising a cantilever formed in the SPM component and operatively coupled to the moveable members, wherein movement in the movable members serves to move the cantilever.

39. (New) The MEMS device of claim 4 further comprising one or more control valves to control a flow of fluid in the one or more fluidic channels.

40. (New) The MEMS device of claim 39 further comprising one or more movable members formed in the SPM component, at least one fluidic channel being formed in a first movable member.

41. (New) The MEMS device of claim 40 wherein the fluid flow comprises one of moving fluid from the fluidic channel formed in the first moveable member to create at least a partial vacuum thereby effecting movement of the first moveable member and moving fluid into the fluidic channel formed in the first moveable member wherein a force of the fluid effects movement of the first moveable member.

42. (New) The MEMS device of claim 40 wherein fluid flow through the at least one fluidic channel produces movement in the first movable member.

43. (New) The MEMS device of claim 42 further comprising a cantilever formed in the SPM component and operatively coupled to the moveable members, wherein a fluidic channel is formed in each moveable member, wherein movement in the movable members serves to move the cantilever.

44. (New) The MEMS device as recited in claim 40 wherein the moveable members act as passive elements.

45. (New) The MEMS device as recited in claim 40 wherein the moveable members produce electrical signals during movement, wherein the electrical signals serve to control subsequent movements.

46. (New) The MEMS device as recited in claim 45 wherein the electrical signals serve to obtain one of a predetermined motion of a first moveable member, a predetermined displacement of the first moveable member, a zero displacement position of the first moveable member.

47. (New) The MEMS device as recited in claim 4 further comprising a circuit for monitoring changes in charge accumulation in the fluidic channel as the isotope is moved by fluid flow.

48. (New) A method for nanoelectric discharge machining using the MEMS device as recited in claim 4, the method comprising imaging a surface to be machined and measuring surface features of the surface to be machined, the imaging and measuring being performed using a scanning probe microscopy technique.

49. (New) The MEMS device of claim 6 further comprising one or more control valves to control a flow of fluid in the one or more fluidic channels.

50. (New) The MEMS device as recited in claim 6 wherein the isotope is Americium 241.

51. (New) The MEMS device as recited in claim 6 wherein the amount of isotope is disposed in a single isotopic region on the SPM device, wherein the single isotopic region contains 1 microcurie or less of radioactivity.

52. (New) The MEMS device such as in claim 6 wherein the amount of isotope comprises a plurality of isotopic regions, each of which contains 1 microcurie or less of radioactivity.

53. (New) The MEMS device as recited in claim 6 further comprising a circuit for monitoring changes in charge accumulation in the fluidic channel as the isotope is moved by fluid flow.

54. (New) The device in claim 6 further comprising a first layer of conductive material, intrinsic diamond, and a second layer of conductive material as successive layers.

55. (New) The device of claim 6 further comprising a layer of boron doped diamond, intrinsic diamond, and a conductor as successive layers.

56. (New) The device of claim 6 further comprising a layer of boron doped diamond, intrinsic diamond, and doped SiC as successive layers.

57. (New) The device of claim 6 further comprising a layer of boron doped diamond, intrinsic silicon carbide, and a conductor as successive layers.

58. (New) The device of claim 6 further comprising a layer of boron doped diamond, intrinsic silicon carbide, and doped silicon carbide as successive layers.

Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 5. This sheet, which includes Fig. 5 replaces the original sheet including Fig. 5.

A portion of the figure was inadvertently cropped when the drawings were prepared for filing. Specifically, the lower right corner of the figure. as filed, is cropped. The attached drawing sheet corrects the error.

Attachment: Replacement Sheet